

14 September 1962

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Dear Norm:

To follow up your question on elastomer seals, we asked to recheck the implications. His initial reports are attached.

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He concludes that the new degassed Viton elastomer, which is reported to have one-tenth of the outgassing of present Viton, could be used in a system with an active pump of reasonable weight, providing the newly reported outgassing does not greatly accelerate at elevated temperatures. However, outgassing is usually accelerated at high temperatures, and our operating temperature is above that for which data is available; so a successful solution is questionable. We are checking O-ring manufacturers for data on outgassing at elevated temperatures, and we will, if data is not available, perform experiments to thoroughly check this possible solution.

In making the numerical estimates (attached), [] had to make one assumption which is probably very optimistic: That the gram-molecular weight of the outgassed material is 100. Actually, if the material outgasses as its constituents (hydrogen, oxygen, carbon, etc.) the volume will be much greater than the 0.05 liter shown at the top of page 3, and pumps would have to be larger than indicated in his analysis.

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The general point is really this: O-rings are quite practical at room temperature or close to it since the outgassing is then rather small; if the temperature is raised, the outgassing increases very rapidly, and pumping requirements are considerably increased. [] for instance, was only able to maintain the good vacuum at room temperature, and the only reason he can use an O-ring sealed window is the very crude vacuum he feels he requires.

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Best regards

Milt
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cc: EPK
JT ✓

25 YEAR RE-REVIEW

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